Hong Kong Competitive Specification — Phase B

DOCUMENT IDENTIFIER: A-SP-ELMF772-00-0000 Rev A, 31-Mar-1992

ABSTRACT: This specification identifies the approved deviations from applicable Digital standards for the manufacture of products in the Hong Kong manufacturing plant. These deviations are grouped according to component, product, and process.

APPLICABILITY: This specification applies only to the Hong Kong manufacturing plant. All current Digital standards will be followed except as specifically noted in this document. This document is to be used in conjunction with the product matrix Engineering specification which relates opportunities to specific products.

STATUS: APPROVED 31-Mar-1992; use VTX SMC for current status.

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1 INTRODUCTION

In order to manufacture competitive products, a core team composed of members from Digital GIA manufacturing in the United States and the Far East developed, evaluated, and tested modifications to manufacturing practices required by current Digital standards and specifications.

1.1 PURPOSE

In an effort to manufacture competitive commodity products this specification identifies and describes approved deviations from applicable Digital standards and specifications accepted for the manufacture of these products.

NOTE

Deviations from applicable Digital standards are highlighted in italic type within the text and boldface in tables appearing under the subheads titled *Proposed Deviation*.

1.2 SCOPE

Approved deviations are grouped under three headings: component, product, and process. This specification identifies the deviations, provides a brief background for each deviation, and lists the current Digital documentation affected.

1.3 DEFINITIONS

No Risk Process:

All deviations will be tested in the product or confirmed by testing in similar products to assure that there is no impact on Quality, Reliability, or Regulatory requirements.

Core Team:

GIA Group Quality Manager, HKO Plant Manager, TAO Plant Manager, ZGO Plant Manager, GIA Group M.E. Manager, GIA Group CE/VQE Manager, VIPPS And GIA Group Manufacturing Manager

PNRF:

Part Number Request Form

SPOC:

Specifications On Computer

MRCI:

Machine Readable Component Information

AVL:

Approved Vendor List

QVL

Qualified Vendor List

QPL

Qualified Part List

1.4 APPLICABILITY

This specification applies only to those products identified within the Hong Kong manufacturing plant and to those products using a specific manufacturing process. The product must pass the "No Risk" process. Products introduced into the same manufacturing plant after the release of this specification and will use the same manufacturing process may use the deviations identified in this specification under certain conditions as follows:

- They must pass the "No Risk" process.

- They must receive the approval of the Core team, through a change to the Product Matrix Engineering Specification.

2 COMPONENT DEVIATIONS

2.1 DEVIATION: USE COMPETITIVE VENDORS' PARTS ON COMPETITIVE PRODUCTS

Develop or implement a system to select and use low-cost parts from competitive vendors. These parts will be put on the low-cost parts list. Once the application proves the selected parts can meet application requirements, the parts will be put on a QVL. The purchase specifications for these parts will be written if needed.

2.1.1 Background

Vendors who are not on an AVL and who are selected on the basis of competitive pricing must be evaluated technically to determine if the exception to AVL is justified, before they can be added to the QVL.

2.1.2 Standards and Other Documents Affected

DEC STD 156-0 Introducing New Purchased Parts and Maintaining Purchased Parts Information: Standard Procedures

DEC STD 156-0

Subhead: **1.4.6 Design Engineer**

Original Text

Initiate the PNRF as early in the design phase as possible.

Proposed Deviation

Initiate the PNRF as early in the design phase as possible. *The PNRF may be processed without listing selected vendors if supplier selection requires application testing.*

2.2 DEVIATION: USE LESS EXPENSIVE BASE MATERIAL FOR METAL PARTS

Develop or expand the Digital specification for selection of base material to be used on metal parts.

2.2.1 Background

Existing Digital specifications do not permit the use of some materials suitable for competitive products.

2.2.2 Standards and Other Documents Affected

A-PS-4811003-GS General Requirements for Mill-Coated, Cold-Rolled, Carbon Steel Sheet

A-PS-4811003-GS

Page 2: **Part Numbers and Revision Levels**

Original Text

Digital Part		Digital Part		Digital Part		Digital Part	
Number	Rev	Number	Rev	Number	Rev	Number	Rev
48-10065-01	A1	48-10065-02	A1	48-10065-03	A1	48-10065-04	A1
48-10069-01	A1	48-10069-02	A1				

Proposed Deviation

Digital Part		Digital Part		Digital Part		Digital Part	
Number	Rev	Number	Rev	Number	Rev	Number	Rev
48-10065-01	A1	48-10065-02	A1	48-10065-03	A1	48-10065-04	A1
48-10069-01	A1	48-10069-02	A1	**48-10069-03**	**A1**		

A-PS-4811003-GS

Page 4: **Part Identification**

Original Text

Digital P/N	Form	Type	Coating
48-10065-01	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-02	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-03	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-04	Sheet	1015 G10150	Galvalume Smooth Rolled ASTM A 792
48-10069-01	Coil	1015 G10150	Galvalume Smooth Rolled ASTM A 792
48-10069-02	Sheet	G3313	Electrolytic, Zinc Coated, Class C ASTM A 591

Proposed Deviation

Digital P/N	Form	Type	Coating
48-10065-01	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-02	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-03	Sheet	1015 G10150	Galvalume Regular Spangle ASTM A 792
48-10065-04	Sheet	1015 G10150	Galvalume Smooth Rolled ASTM A 792
48-10069-01	Coil	1015 G10150	Galvalume Smooth Rolled ASTM A 792
48-10069-02	Sheet	G3313	Electrolytic, Zinc Coated, Class C ASTM A 591
48-10069-03	**Sheet**	**1010**	**Electrolytic, Zinc Coated, Class B ASTM A 591**

A-PS-4811003-GS

Page 5: **Dimensions**

Original Text

	Dimensions		
Digital Part Number	Thickness ±0.003	Width +0.100/-0.000	Length ±0.100
48-10065-01	0.038	48.000	96.00
48-10065-02	0.050	48.000	96.00
48-10065-03	0.061	48.000	96.00
48-10065-04	0.030	42.000	96.00
48-10069-01	0.030	42.000	20,000 LBS Coil
48-10069-02	0.048	4.00	6.50

Proposed Deviation

	Dimensions		
Digital Part Number	Thickness ±0.003	Width +0.100/-0.000	Length ±0.100
48-10065-01	0.038	48.000	96.00
48-10065-02	0.050	48.000	96.00
48-10065-03	0.061	48.000	96.00
48-10065-04	0.030	42.000	96.00
48-10069-01	0.030	42.000	20,000 LBS Coil
48-10069-02	0.048	4.00	6.50
48-10069-03	**0.048**	**48.000**	**96.000**

2.3 DEVIATION: STREAMLINE THE SUPPLIER QUALITY PROGRAMS BY USING SPOC AS THE SOURCE FOR PARTS ON STS INSTEAD OF ACTUAL QPL

This is a deviation from a long-standing operating policy used by all of the secondary STS plants wishing to take advantage of another plant's agreement. The deviation will be to no longer request a copy of the agreement or QPL from the primary plant.

2.3.1 Background

QPLs are the primary source for the list of parts on ship to stock which are managed by primary plants worldwide. To access these listings and maintain them up to date is a very time-consuming effort.

The SPOC vendor program code provides a single focal point to obtain the list of part vendors on ship to stock. This focus will increase our opportunity to reduce incoming inspection and costs in general.

2.3.2 Standards and Other Documents Affected

No standard or specification is affected.

3 PRODUCT DEVIATIONS

There are no product deviations.

4 PROCESS DEVIATIONS

4.1 DEVIATION: USE NO-CLEAN FLUX IN WAVE-SOLDERING PROCESS

Use no-clean flux in the wave-soldering process so that postcleaning after wave soldering is unnecessary.

4.1.1 Background

The implementation of a no-clean flux during wave soldering eliminates the need for module cleaning after the thru-hole (PTH) assembly process. Savings in water and detergent costs as well as the elimination of wastewater discharge will also be realized.

4.1.2 Standards and Other Documents Affected

DEC STD 116-1 Workmanship Standards Manual - Printed-Circuit Boards
A-SP-ELMF299-00, Printed Circuit Boards/Modules, Cleaning Process Contamination

DEC STD 116-1

Subhead: **4.1 Contamination**

Original Text

4.1 Contamination

1. Contamination by any foreign material that may affect surface resistivity of the printed circuit assembly is not acceptable.
2. Foreign material shall be removed by thorough cleaning. Particular care shall be taken to eliminate the following :

- metal chips	- flux concentrations
- filings	- rosin flakes
- clippings	- loose terminals
- salt (food residue)	- solder balls
- wire strands	- solder splashes

Proposed Deviation

4.1 Contamination

1. Contamination by any foreign material that may affect surface resistivity of the printed circuit assembly is not acceptable.
2. Foreign material shall be removed by thorough cleaning. Particular care shall be taken to eliminate the following:

- metal chips	- flux concentrations (**except flux from qualified no-clean wave soldering flux**)
- filings	- rosin flakes
- clippings	- loosen terminal
- salt (food residue)	- solder balls
- wire strands	- solder splashes

DEC STD 116-1

Subhead: **4.3 Acceptable (Minimum)**

Original Text

4.3 Acceptable (Minimum)

1. Wax from capacitors on the module, not in the area of the contact fingers or connectors.
2. Small quantities of thermal compound are acceptable on a module provided it is not more than 1/16 of an inch (0.063 inch or 1.59 mm) from the component (containing compound) and does not contact another circuit.

Proposed Deviation

4.3 Acceptable (Minimum)

1. Wax from capacitors on the module, not in the area of the contact fingers or connectors.
2. Small quantities of thermal compound are acceptable on a module provided that it is no more than 1/16 of an inch (0.063 inch or 1.59 mm) from the component (containing compound) and does not contact another circuit.
3. *Flux residue from qualified no-clean wave-soldering flux is acceptable on a module provided it is not in the area of the contact fingers or connectors.*

A-SP-ELMF299-00

Head: **6 INTERPRETING THE TEST DATA**

Original Text

No number has ever been identified that will cause a failure of the module. Therefore, any number below 20 micrograms of sodium chloride per square inch of module should be acceptable provided there is no visual contamination on the module such as flux residues and oil.

Proposed Deviation

No number has ever been identified that will cause a failure of the module. Therefore, any number below *25* micrograms of sodium chloride per square inch of module should be acceptable provided there is no visual contamination on the module such as flux residues *(except flux from qualified no-clean wave-soldering flux)* and oils.

4.2 DEVIATION: USE NO-CLEAN SOLDER PASTE IN SMT SOLDER REFLOW PROCESS

Use no-clean solder paste in SMT solder reflow process so that post cleaning after solder reflow is unnecessary.

4.2.1 Background

The acceptance and use of no-clean solder paste in Hong Kong is the final phase of a 100% no-clean operation. The elimination of aqueous cleaning and associated chemicals costs as well as the elimination of enviromental wastewater discharge will be realized.

4.2.2 Standards and Other Documents Affected

- *DEC STD 116-1 Workmanship Standards Manual - Printed-Circuit Boards*
- *A-SP-ELMF299-00, Printed Circuit Boards/Modules, Cleaning Process Contamination*

DEC STD 116-1

Subhead: **4.1 Contamination**

Original Text

4.1 Contamination

1. Contamination by any foreign material that may affect surface resistivity of the printed circuit assembly is not acceptable.
2. Foreign material shall be removed by thorough cleaning. Particular care shall be taken to eliminate the following :

- metal chips	- flux concentrations
- filings	- rosin flakes
- clippings	- loose terminals

- salt (food residue)
- wire strands
- solder balls
- solder splashes

Proposed Deviation

4.1 Contamination

1. Contamination by any foreign material that may affect surface resistivity of the printed circuit assembly is not acceptable.
2. Foreign material shall be removed by thorough cleaning. Particular care shall be taken to eliminate the following :

- Metal chips
- filings
- clippings
- salt (food residue)
- wire strands
- Flux concentrations (**except flux from qualified no-clean paste**)
- rosin flakes
- loose terminals
- solder balls
- solder splashes

DEC STD 116-1

Subhead: **4.3 Acceptable (Minimum)**

Original Text

4.3 Acceptable (Minimum)

1. Wax from capacitors on the module, not in the area of the contact fingers or connectors.
2. Small quantities of thermal compound are acceptable on a module provided that it is not more than 1/16 of an inch (0.063 inch or 1.59 mm) from the component (containing compound) and does not contact another circuit.

Proposed Deviation

4.3 Acceptable (Minimum)

1. Wax from capacitors on the module, not in the area of the contact fingers or connectors.
2. Small quantities of thermal compound are acceptable on a module provided it is no more than 1/16 of an inch (0.063 inch or 1.59 mm) from the component (containing compound) and does not contact another circuit.
3. *Flux residue from qualified no-clean solder paste is acceptable on a module provided it is not in the area of the contact fingers or connectors.*

A-SP-ELMF299-00

Head: **6 INTERPRETING THE TEST DATA**

Original Text

No number has ever been identified that will cause a failure of the module. Therefore, any number below 20 micrograms of sodium chloride per square inch of module should be acceptable provided there is no visual contamination on the module such as flux residues and oil.

Proposed Deviation

No number has ever been identified that will cause a failure of the module. Therefore, any number below *25* micrograms of sodium chloride per square inch of module should be acceptable provided there is no visual contamination on the module such as flux residues *(except flux from qualified no-clean solder paste)* and oils.

4.3 DEVIATION: ACCEPTANCE OF METAL CHASSIS WITH MINOR SCRATCHES

Minor scratches which are not visible from outside the end product appear on chassis.

4.3.1 Background

Based on evaluation and test results, minor scratches will not affect the form, fit, and function of the chassis. Since the majority of chassis will be installed inside another chassis or cabinet, visability of the scratches will be minimal.

4.3.2 Standards and Other Documents Affected

A-SP-7665333-0-0 Zinc Plating and Chromate Treatment: Inspection Procedures

A-SP-7665333-0-0

Subhead: **3.2 ALLOWABLE CONDITIONS**

Proposed Deviation

Add the following condition.

f. Other scratches are allowed when they pass the following acceptance criteria.

Acceptance Criteria:

Viewing distance: Parts shall be inspected from a distance of 60 in
Viewing area: Within a 6 in × 6 in area

Length	*Depth*	*Max Qty*
0.5 in to 3.0 in	*Not showing based materials*	*8*

4.4 DEVIATION: REVISE ACCEPTANCE CRITERIA FOR MACHINE-ROUTED COMPONENT LEADS

Accept leads with minimal burrs, caps, and flags.

4.4.1 Background

Burrs, flags, and associated rough edges on leads are acceptable when they cannot be dislodged from the lead or interfere with adjacent leads. Savings in reduced touch-up labor will be realized if burrs and flags on leads are not reworked after solder.

4.4.2 Standards and Other Documents Affected

DEC STD 116-1 Workmanship Standards Manual - Printed-Circuit Boards

DEC STD 116-1

Subhead: **25.3 Acceptable (Minimum)**

Original Text

Slight distortion of lead diameter. Material that is distorted cannot be removed by hand. This distortion may indicate that the router is out of adjustment, or that the blade is dulling.

Proposed Deviation

Slight distortion of lead diameter. Material that is distorted cannot be removed by hand. This distortion may indicate that the router is out of adjustment or that the blade is dulling.

Burrs, flags, and the like on leads are acceptable when they can not dislodge from the leads and maintain a minimum spacing of 0.020 in from any other leads or conductive hardware.

NOTE

Safety requirements will take precedence over the 0.020 in minimum spacing if required to meet safety standards.

DEC STD 116-1

Subhead: **25.4 Unacceptable**

Original Text

Burrs, caps, flags, etc. on leads are not acceptable. The burrs, flags, etc. could become dislodged from the lead and therefore should be hand trimmed.

Proposed Deviation

Burrs, caps, flags, and so forth, on leads are not acceptable and should be hand trimmed when they cannot maintain a minimum spacing of 0.020 in from any other leads or conductive hardware.

NOTE

Safety requirements will take precedence over the 0.020 in minimum spacing if required to meet safety standards.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00116-01	*DEC STD 116-1 Workmanship Standards Manual - Printed-Circuit Boards*
EL-00156-00	*DEC STD 156-0 Introducing New Purchased Parts and Maintaining Purchased Parts Information: Standard Procedures*
EL-MF299-00	*Printed-Circuit Boards/Modules: Cleaning Process Contamination*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

A.2 Other Digital Documents

Document Number	Document Title
APS4811003GS	*General Requirements for Mill-Coated, Cold-Rolled, Carbon Steel Sheet*
ASP766533300	*Zinc Plating and Chromate Treatment: Inspection Procedures*

APPENDIX B RELATED DOCUMENTS

B.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00092-00	*DEC STD 092-0 Finish and Color Standard - Introduction and General Requirements*
EL-00116-00	*DEC STD 116-0 Workmanship Standards Manual - Introduction*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

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